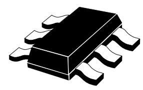
LOW VOLTAGE 4Ω SPDT SWITCH

- HIGH SPEED:
  t_{PD} = 0.3ns (TYP.) at V_{CC} = 5V
  t_{PD} = 0.4ns (TYP.) at V_{CC} = 3.3V
- LOW POWER DISSIPATION:
  I_{CC} = 1μA(MAX.) at T_A=25°C
- LOW "ON" RESISTANCE:
  R_{ON} = 4Ω (MAX. T_A=25°C) AT V_{CC} = 5V
  R_{ON} = 6Ω (TYP.) AT V_{CC} = 3V
- WIDE OPERATING VOLTAGE RANGE:
  V_{CC} (OPR) = 1.8V TO 5.5V SINGLE SUPPLY



SOT23-6L

Table 1: Order Codes

PACKAGE	T & R
SOT23-6L	STG719STR

DESCRIPTION

The STG719 is an high-speed S.P.D.T. (Single Pole Double Throw) SWITCH fabricated in silicon gate C^2MOS technology. It designed to operate from 1.8V to 5.5V, making this device ideal for portable applications, audio signal routing, video switching, mobile and communication systems.
It offers 4Ω ON-Resistance Max at 5V 25°C and very low ON-Resistance Flatness. Additional key features are fast switching speed (t_{ON}=7ns, t_{OFF}=4.5ns), Break Before Make Delay Time and Low Power Consumption.
All inputs and outputs are equipped with protection circuits against static discharge, giving them ESD immunity and transient excess voltage.
It's available in the commercial and extended temperature range.

Figure 1: Pin Connection And IEC Logic Symbols

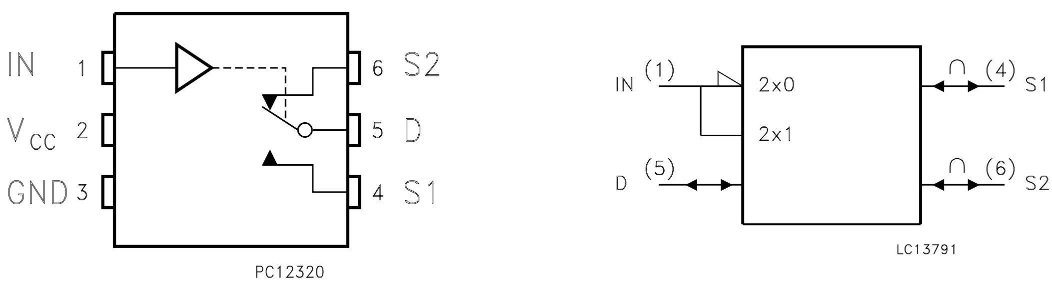


Figure 2: Input Equivalent Circuit

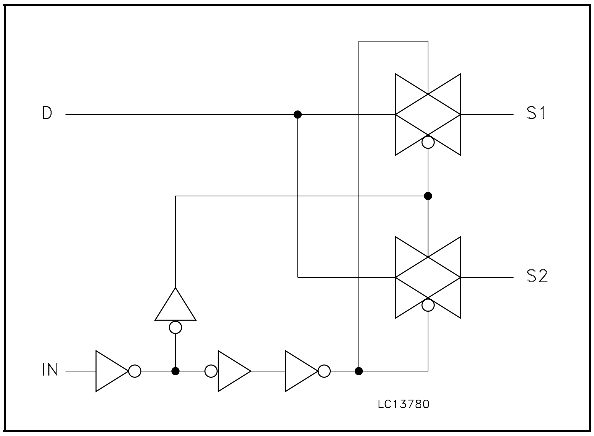


Table 2: Pin Description

PIN N°	SYMBOL	NAME AND FUNCTION
1	IN	Control
4, 6	S1, S2	Independent Channel
5	D	Common Channel
2	V_{CC}	Positive Supply Voltage
3	GND	Ground (0V)

TRUTH TABLE

IN	SWITCH S1	SWITCH S2
L	ON	OFF
H	OFF	ON

Table 3: Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	-0.5 to +7.0	V
V_I	DC Input Voltage	-0.5 to V_{CC} + 0.5	V
V_{IC}	DC Control Input Voltage	-0.5 to V_{CC} + 0.5	V
V_O	DC Output Voltage	-0.5 to V_{CC} + 0.5	V
I_{IK}	DC Input Diode Current	± 20	mA
I_{OK}	DC Output Diode Current	± 20	mA
I_O	DC Output Current	± 50	mA
I_{CC} or I_{GND}	DC V_{CC} or Ground Current	± 50	mA
T_{stg}	Storage Temperature	-65 to +150	°C
T_L	Lead Temperature (10 sec)	300	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied

Table 4: Recommended Operating Conditions

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage (note 1)	1.8 to 5.5	V
V_I	Input Voltage	0 to V_{CC}	V
V_{IC}	Control Input Voltage	0 to V_{CC}	V
V_O	Output Voltage	0 to V_{CC}	V
T_{op}	Operating Temperature	-55 to 125	°C
dt/dv	Input Rise and Fall Time on control pin (note 2)	0 to 10	ns/V
dt/dv	Input Rise and Fall Time on I/O pins	0 to DC	ns/V

1) Truth Table guaranteed: 1.2V to 6V
2) V_{IN} from 30% to 70% of V_{CC}

Table 5: DC Specifications

Symbol	Parameter	Test Condition		Value							Unit
		V_{CC} (V)		T_A = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
V_{IHC}	High Level Control Input Voltage	3.3(*)		2.0			2.0		2.0		V
		5.0(**)		2.4			2.4		2.4		
V_{ILC}	Low Level Control Input Voltage	3.3(*)				0.4		0.4		0.4	V
		5.0(**)				0.8		0.8		0.8	
R_{ON}	ON Resistance	3.3(*)	V_S = 0 to V_{CC} I_S = 10mA		6	7		10		12	Ω
		5.0(**)				4		5		6	
ΔR_{ON}	ON Resistance	3.3(*)	V_S = 0 to V_{CC} I_S = 10mA		0.1			0.4			Ω
		5.0(**)			0.1			0.4			
R_{FLATON}	ON Resistance fLATNESS	3.3(*)	V_S = 0 to V_{CC} I_S = 10mA		2.5						Ω
		5.0(**)			0.75						
I_{SOFF}	Source OFF Leakage	3.3(*)	V_S =1V or V_{CC} V_{DD} = V_{CC} or 1V V_{IN} = V_{CC} or GND		±0.01	±0.25		± 0.35		± 3.5	nA
		5.0(**)			±0.01	±0.25		± 0.35		± 3.5	
I_{SON}	Channel ON Leakage	3.3(*)	V_S=V_D=1V to V_{CC}-2.5V V_{IN} = V_{IHC}		±0.01	±0.25		± 0.35		± 3.5	nA
		5.0(**)			±0.01	±0.25		± 0.35		± 3.5	
I_{IN}	Control Input Leakage Current	3.3(*)	V_I = V_{IH} or V_{IL}		0.005			±0.1		±1	µA
		5.0(**)			0.005			±0.1		±1	
I_{CC}	Quiescent Supply Current	3.3(*)	V_I = V_{CC} or GND		0.001	1		1		2	µA
		5.0(**)			0.001			1		2	

(*) Voltage range is 3.3V ± 0.3V
(**) Voltage range is 5V ± 0.5V

Table 6: AC Electrical Characteristics (C_L = 35pF, R_L = 300Ω)

Symbol	Parameter	Test Condition		Value							Unit
		V_{CC} (V)		T_A = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
t_{PD}	Delay Time	3.3(*)	V_S = 3V square wave f = 1MHz $t_r = t_f$ = 6ns		0.4	0.8		1.2		2.4	ns
		5.0(**)			0.3	0.6		1.0		2.0	
t_{ON}	ON Channel Time	3.3(*)	V_S = 2V		10			16		19	ns
		5.0(**)	V_S = 3V		7			11		13	
t_{OFF}	OFF Channel Time	3.3(*)	V_S = 2V		5.5			7		8.5	ns
		5.0(**)	V_S = 3V		4.5			6		7.5	
t_D	Break Before Make Time Delay	3.3(*)	V_S = 2V	1	4						ns
		5.0(**)	V_S = 3V	1	4						
C_{SOFF}	OFF Channel Capacitance				19						pF
C_{SON}	ON Channel Capacitance				33						pF

(*) Voltage range is 3.3V ± 0.3V
(**) Voltage range is 5.0V ± 0.5V

Table 7: Analog Switch Characteristics (GND = 0V; T_A = 25°C)

Symbol	Parameter	Test Condition		Value	Unit
		V_{CC} (V)		Typ.	
f_{MAX}	Frequency Response (Switch ON)	3.3(*)	Bandwidth at -3dB	200	MHz
		5.0(**)		200	
	Feed through Attenuation (Switch OFF)	3.3(*)	f_{IN} = 10MHz sine wave	-40	dB
		3.3(*)	f_{IN} = 1MHz sine wave	-74	
		5.0(**)	f_{IN} = 10MHz sine wave	-40	
		5.0(**)	f_{IN} = 1MHz sine wave	-74	
	Crosstalk (Control Input to Signal Output)	3.3(*)	f_{IN} = 10MHz sine wave	-39	dB
		3.3(*)	f_{IN} = 1MHz sine wave	-52	
		5.0(**)	f_{IN} = 10MHz sine wave	-39	
		5.0(**)	f_{IN} = 1MHz sine wave	-52	

(*)Voltage range is 3.3V ± 0.3V
(**) Voltage range is 5.0V ± 0.5V

TEST CIRCUITS

Figure 3: On Resistance

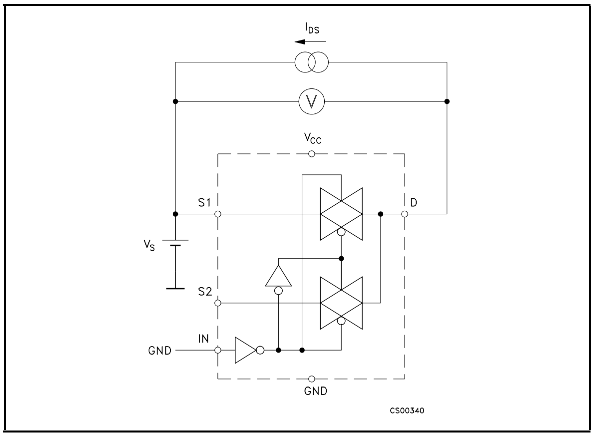


Figure 6: Off Isolation

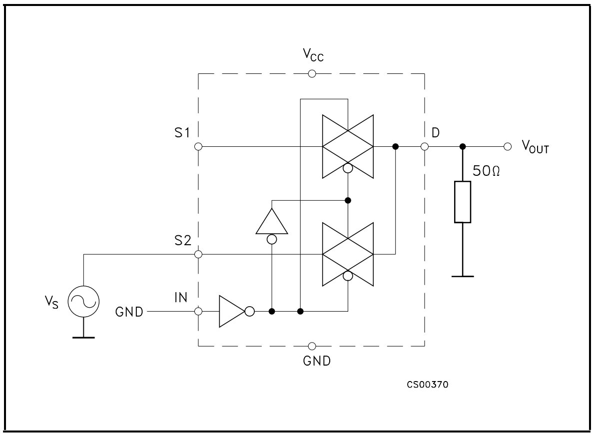


Figure 4: On Leakage

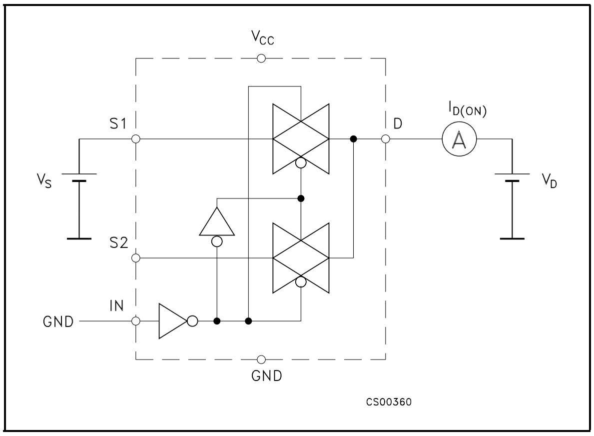


Figure 7: Bandwidth

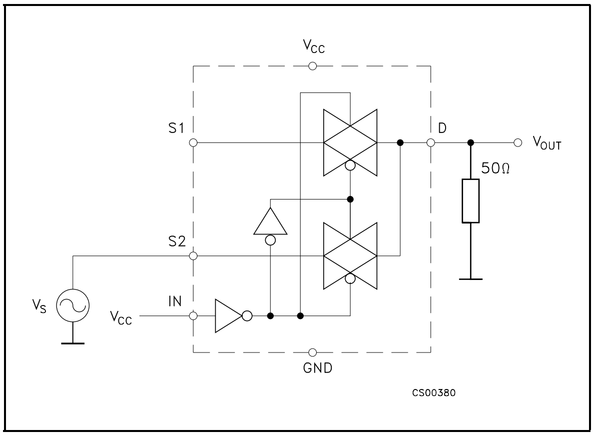


Figure 5: Off Leakage

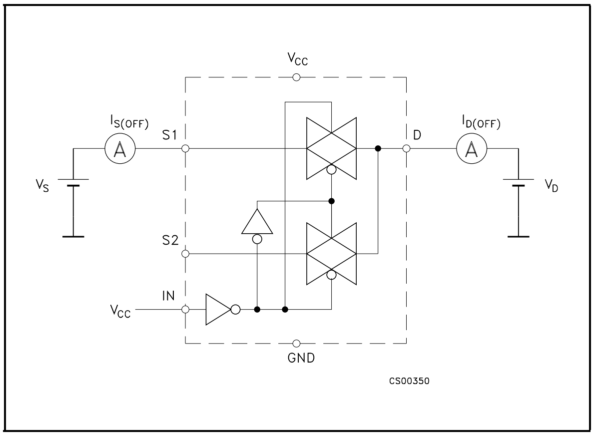


Figure 8: Channel To Channel Crosstalk

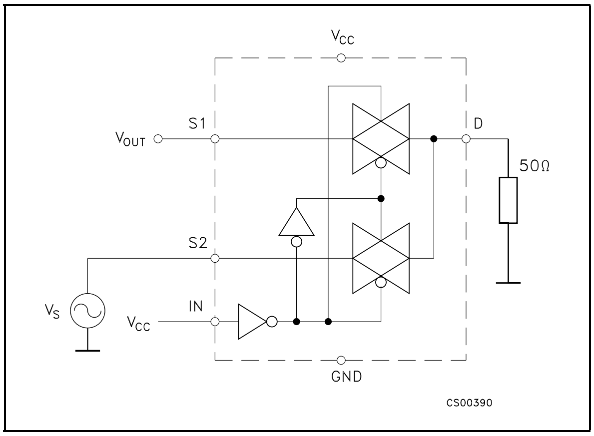


Figure 9: Switching Times

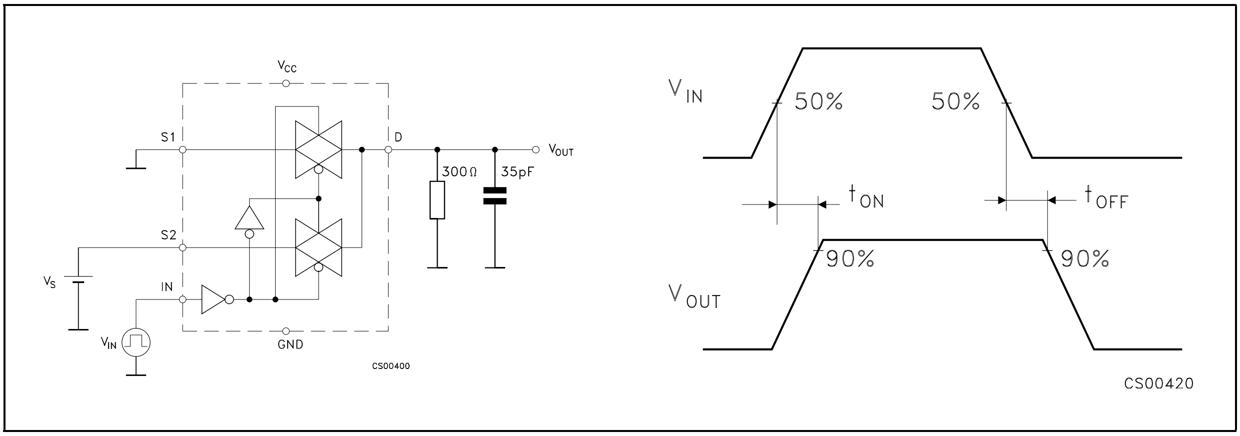
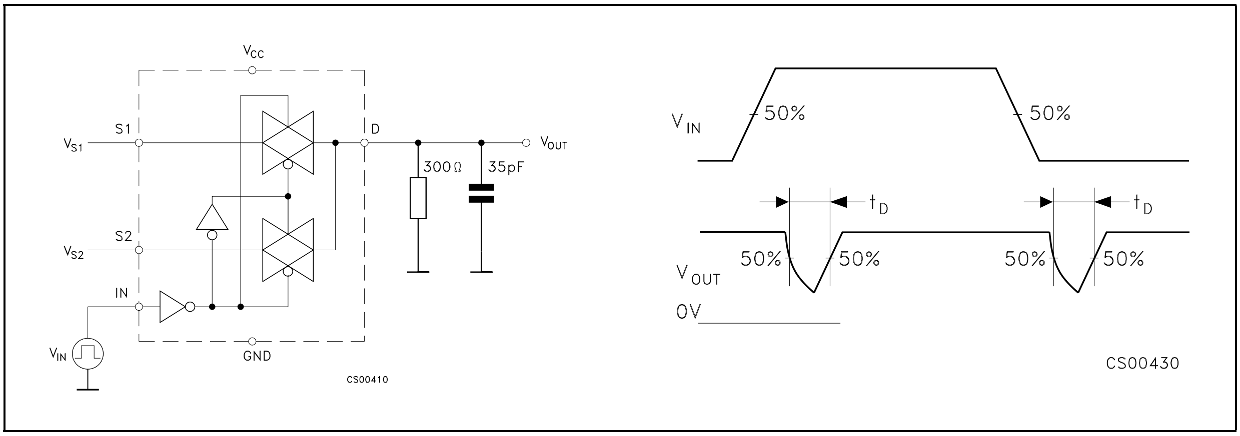
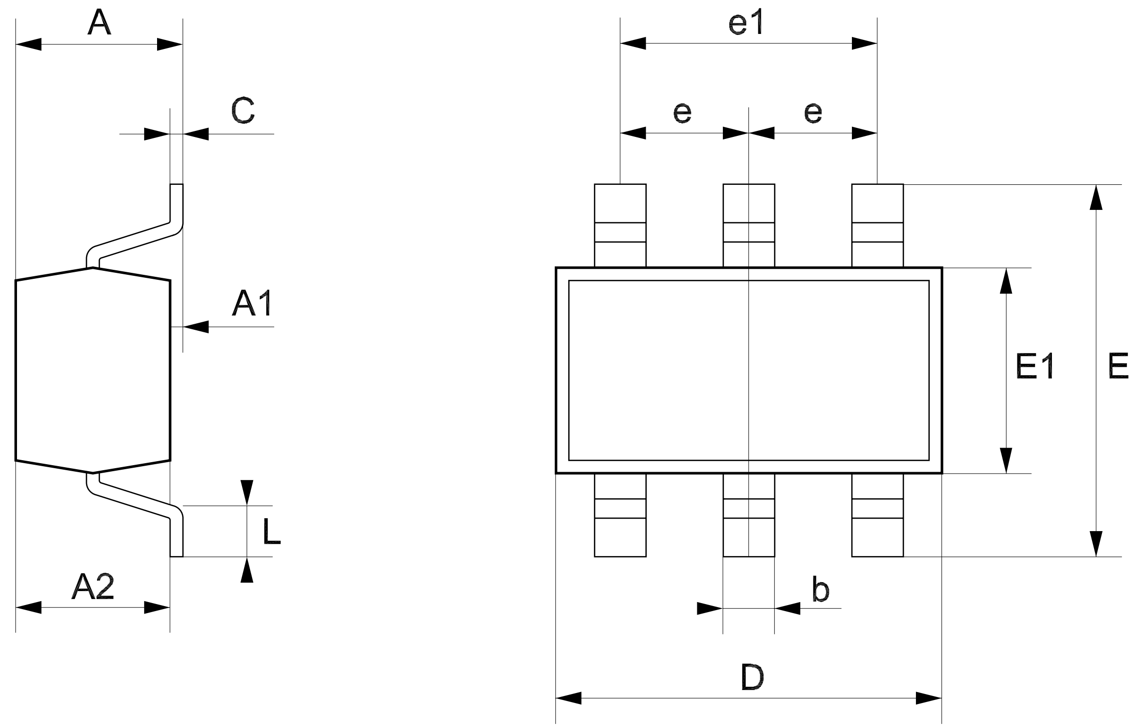


Table 8: Break Before Make Time Delay



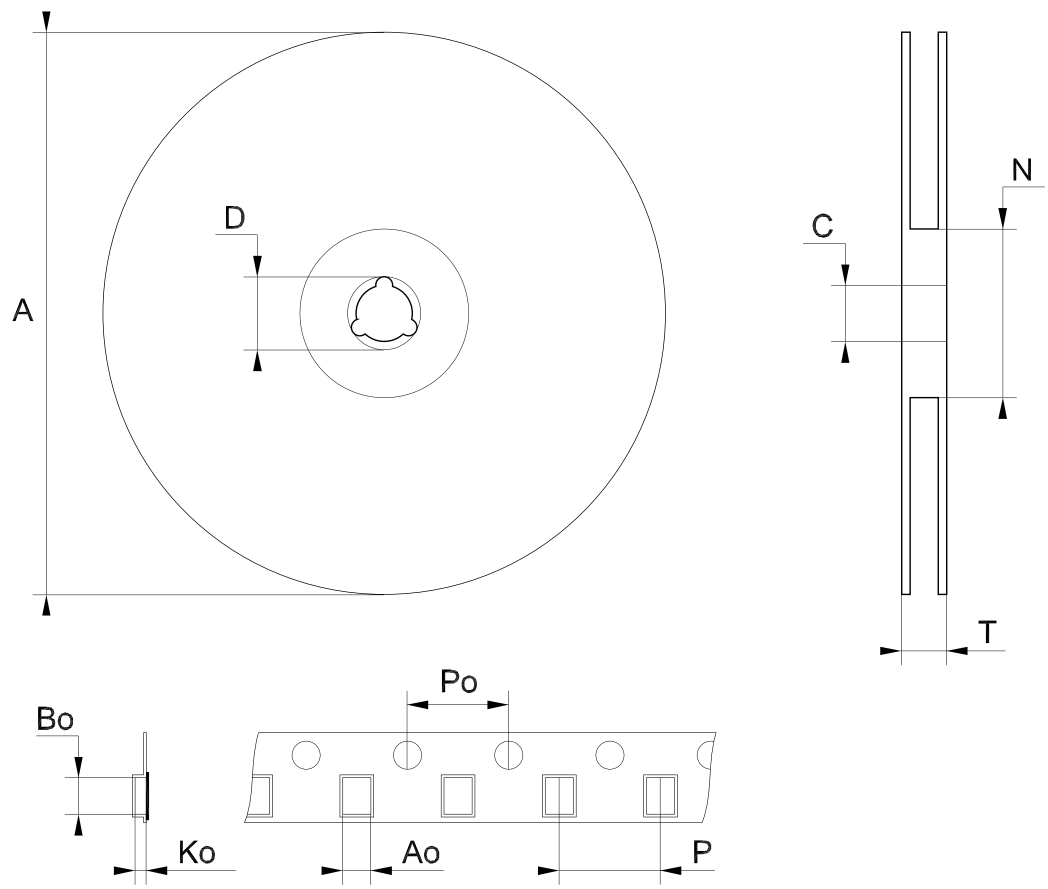
SOT23-6L MECHANICAL DATA

DIM.	mm.			mils		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A	0.90		1.45	35.4		57.1
A1	0.00		0.15	0.0		5.9
A2	0.90		1.30	35.4		51.2
b	0.35		0.50	13.7		19.7
C	0.09		0.20	3.5		7.8
D	2.80		3.00	110.2		118.1
E	2.60		3.00	102.3		118.1
E1	1.50		1.75	59.0		68.8
e		0.95			37.4	
e1		1.9			74.8	
L	0.35		0.55	13.7		21.6



Tape & Reel SOT23-xL MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			180			7.086
C	12.8	13.0	13.2	0.504	0.512	0.519
D	20.2			0.795		
N	60			2.362		
T			14.4			0.567
Ao	3.13	3.23	3.33	0.123	0.127	0.131
Bo	3.07	3.17	3.27	0.120	0.124	0.128
Ko	1.27	1.37	1.47	0.050	0.054	0.0.58
Po	3.9	4.0	4.1	0.153	0.157	0.161
P	3.9	4.0	4.1	0.153	0.157	0.161



Note: Drawing not in scale

Table 9: Revision History

Date	Revision	Description of Changes
25-Nov-2004	8	Mistake on Figure 1.